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DEFENSE PLANNING AND BUDGETING: THE ISSUE OF CENTRALIZED CONTROL

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This paper is to be published in the monograph series of the Industrial College of the Armed Forces for use in its instructional program. The original paper of 1963-64 has been slightly adapted and the Author's Note added for the final version.

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Author's Note

This study was initiated in 1963 and completed early in 1964. At that time the new DoD procedures had just begun to take hold. It was RAND's purpose to help clarify the objectives and mechanics of the new procedures, to assist the Services in adjusting to the developing system, but above all to anticipate some of the longer-run implications of these changes. The completed study did receive some circulation within an audience limited primarily to the Air Force. It is gratifying that the interpretations and the judgments offered in it have stood the test of time sufficiently well that the Industrial College of the Armed Forces now wishes to publish it for use in its instructional program.

In retrospect, I might alter the phrasing of certain points, but the basic conclusions would remain unchanged. There is one partial exception, and it is part of a larger problem. In recent years I have become less sanguine regarding the efficacy of inter-Service rivalry and criticism (useful as it may be) or the potential of the major Commands for flushing out new alternatives or criticizing obsolescent activities. Large hierarchical organizations, whether characterized by centralization, or by partial decentralization in tri-partite manner, or even by greater responsibility devolving to the Command level, tend to be remarkably efficient mechanisms for the suppression of new ideas and alternatives. In part, this is inevitable. Conceptual innovations are <u>disorganizing</u>. The Services, and especially the operating Commands, place a premium on <u>organization</u>. Nonetheless, momentarily putting aside the question of the appropriate degree of centralization, the alternative-generation process within the Services has not been as effective as we would wish. The Services will have to do more in improving the incentives for generating alternatives and the receptivity given to innovations. The more effective the performance of subordinate hierarchies, the more powerful is the case for decentralization.

On an intimately related point, the prognostications regarding the impact of small-group coalescence around a limited range of views have turned out to be distressingly germane for subsequent developments. As

an example I cite the primacy placed upon Assured Destruction within the OSD in recent years. It has not only dominated force structure decisions, but has strongly affected both the evaluation of alternatives and the emphasis in the R&D program. Within a more limited arena, the incentives created have not been much different from those to come within the charmed nuclear circle that applied during the era of Massive Retaliation. Perhaps the alternative generation process within the Services has been adequate, but the incentives proferred both to the Services and to industrial contractors have been clearly marked. I believe the consequences of this narrowing range of acceptability to be harmful. To be sure, it is suggested that we buy more than enough for Assured Destruction, and the margin can be devoted to Damage Limiting. But this rests on the presupposition that weapon systems bought for one role can perform effectively in another role -- in other words, that a high degree of substitutability applies. This presupposition strikes me as unwarranted. The particular set of decisions involved may be defended or questioned, but they do point to the risks inherent in the limited perspectives of a single group.

While I would like to draw renewed attention to these points, I have done little to alter the main text in the light of subsequent developments. Certain changes in nomenclature have taken place: Subject Issue is now Program Budget Decision; Program Change Proposal is now Program Change Request, and so on. In the large the system has been only slightly altered in the intervening years, and these changes are of little importance. I have not updated certain references, such as those to the TFX. Rather than seem to be indulging in hindsight I leave the material in its original form -- to exploit whatever clairvoyant value it may be deemed to possess.

This note would be incomplete, were I not to express my indebtedness to Roland McKean, who was an original participant in the study. His contributions are reflected throughout, even though I am prepared to take responsibility for any deficiencies. McKean's decision to return to academic life precluded his involvement at the close. Of greater importance, from the standpoint of defense analyses his departure remains an even more regretted loss.

I. HIGHLIGHTS OF THE REVOLUTION IN DEFENSE MANAGEMENT

The main feature of the revolution, as most people see it, is the centralization of control over many matters that were formerly controlled by the individual Services. That decisions in so far-flung an organization as the Department of Defense must always be made in the light of a variegated pattern of advice and bargaining pressures is a fact that should never be ignored. Yet in recent years the Office of the Secretary of Defense has clearly played a stronger role than formerly in major force-structure and development decisions and also in many lesser choices.

Through his influence on the budget, the Secretary of Defense has in the past always been able to exercise a great deal of negative control -- by withholding approval, by vetoing suggestions, even by bargaining. Of late, however, the affirmative power of the OSD to implement its own ideas while blocking rival ideas has increased markedly. Concurrently, the power of the Services to propose, to persuade, to implement, has shrunk. Though the trend toward centralization was noticeable before 1961, a marked acceleration occurred at that point. Mr. Robert S. McNamara has been an unusually forceful Secretary of Defense. The offices of the Director of Defense Research and Engineering (DDR&E) have monitored research and development programs more closely than before -- eliminating, cutting, deferring, and occasionally initiating or increasing individual R&D projects (or even tasks). Other parts of OSD have strongly influenced various choices. The Services, on the other hand, have had less influence on most of these decisions.

What events yielded this outcome or made it possible? Probably the main thing was not changes in the formal institutional structure but a massive shift in power resulting from (1) the appointment of a Secretary of Defense who had the will and ability to exert a greater degree of control, and (2) the existence of considerable support from the White House and Congress (in good part reflecting dissatisfaction with the

way defense planning had previously been managed). Given this basic shift in the structure of power, decision-making roles have altered. Concurrently a number of institutional changes emerged. Some of these changes may have played at least a partial supporting role in the centralization process, yet the case for them is in large measure independent of their connection to centralization. Even if the power structure were to shift again, many such changes would almost certainly remain. In this study we will give special attention to some of these institutional changes and the effects they may have when accompanied by marked centralization.

One of the most significant institutional modifications is the new budgeting-programming system. It is comprised of several more-or-less separable elements: (1) the new format in which plans and budgets are presented in terms of Programs and program elements, categories that are at least somewhat more like outputs than the conventional Appropriations categories; (2) extensive use of special papers and cost-effectiveness analyses to provide additional aid in deciding how resources should be allocated among Programs and program elements; (3) bookkeeping devices for checking on the Services and Commands to make sure that the OSD allocations and decisions are being implemented.

The first element alone, the new format, is essentially a supplementary information system -- an attempt to show the cost implications of Programs and of certain changes in them. The second element, cost-effectiveness studies, aims to provide additional and particularly relevant information about alternatives that are deemed to be particularly important. These studies have apparently played significant roles in budgeting-programming decisions. The third element, a mechanism to see that the Services adhere to the accepted Programs, is a vital part of the existing system. Without such a mechanism, OSD would make decisions, but the Services could then take their budgets and, within limits, do what they pleased with them.

The particular mechanism that is used involves several devices: (1) a five-year plan -- the approved Five-Year Force Structure and

Financial Program (now the Five Year Defense Program) -- that provides a base line; (2) a system of progress reporting; (3) reprogramming procedures for seeking changes in the current year and the fiscal year shown in the published budget; (4) mechanisms for seeking changes in the subsequent "program years" -- Program Change Proposals or PCP's (now called Program Change Requests or PCRs). The latter are formal requests for permission to depart from the accepted program and are also a means of keeping score on accepted changes.

In connection with these devices several points should be noted. First, the five-year plan or Blue Book is becoming an effective base line, at least in the sense that unexplained revisions will no longer appear. At first there was much confusion, and no "audit trail" that could show exactly how the base line plus approved changes yielded the updated base. Completely new figures were sometimes introduced as the updated version. Now, however, the updated Blue Book will be precisely the old base line plus approved changes and officially noted lists of below-threshold changes. Second, most significant proposals require reprogramming requests or, if future "program years" are affected, PCPs. Under specified conditions, a Service can make minor, i.e., below-threshold, resource transfers or substitutions, but significant shifts of resources from one program-element to another, as well as proposals that would increase total obligational authority, require OSD approval.

In the Financial Programs, and of course in the proposed changes, operating costs are, quite properly, segregated from investment costs, and the system functions differently with respect to these different costs. Departures from authorized investment or major procurement costs can rather easily be detected in most program elements. Aircraft and submarines and Honest John battalions are easily counted (although as noted later, this is true with or without the new system). Deviations from approved allocations of operations and maintenance (O&M) costs, however, are not so easily detected, because the estimates <u>for individual program elements</u> are exceedingly rough and are not linked to identifiable resources. If they wished,

therefore, the Services could probably shift O&M items from one program element to another without penalty.*

R&D costs are also quite properly segregated (properly because it would be misleading to show investment or operating costs as necessarily being entailed by development decisions).** In basic research and exploratory development the 5-year plan, or Blue Book, provides for a rising level of effort. When the annual budget is prepared, OSD has usually trimmed the amount for the coming year below the programmed figure, and Service requests have seldom pressed against the ceiling on total obligational authority. As a consequence, at present PCP's rarely figure in the process. Nevertheless, DDR&E exercises control in this case by means of detailed review of the R&D programs. In Advanced Development, however, considerable control is exercised through the PCP mechanism. In addition, deferrals can make sure that the Services are unable to do things without the approval of DDR&E. For acceptance in Engineering or Systems Development, a proposal must survive an exhaustive screening process prior to entering Program Definition -- another decision-making point at which OSD exerts control.

Several other points about the functioning of the system should be mentioned. First, while the Five-Year Financial Program is somewhat helpful to the decision-makers in deciding upon resource allocation among program elements, it is appropriate to supplement it by special analyses for important decisions. Collecting costs in terms of program elements reveals only the roughest of clues to the information that is needed. What one typically should have is the cost of an increment or a decrement, not the cost of the entire existing program. Moreover, one should have the cost of a

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*Within the Air Force the P-documents give a basis for internal control, but they were never drawn up in terms of the program-element structure and do not offer an easy means of enforcing allocations, program element by program element.

**However, to the extent that weapons systems are introduced into the operational packages before R&D has been completed (or before executing the Program Definition Phase), the distinction becomes quite blurred. The handling of the TFX is a case in point.

particular kind of increment, not a "representative" slice, because there is no unique program-element cost that is appropriate under all circumstances: Are new facilities required, or are part of them on hand? Will bases be available because something else is being phased out? In what climate will the extra activity be conducted? Any cost analyst will ask dozens of questions before trying to estimate the relevant costs of a proposed change. Also, of course, the Blue Book gives no clues to effectiveness, and wherever possible one needs ad hoc analyses (and judgments) to provide such clues. Again the interrelationships between program elements makes this depend upon the particular circumstances. The gain in effectiveness attributable to an increment to C-141 (Troop Carrier) depends upon what is happening to C-141 (Air Transport) and to C-123 (Air Transport, Reserve and Guard Forces). The loss in effectiveness due to a reduction in Surveillance and Warning Systems depends upon what is being done to the B-52 program element. These are some of the reasons why the new budget format per se has a somewhat limited impact and why ad hoc cost-effectiveness analysis and "special papers" are important parts of the OSD system.*

The strong interrelationships between Programs, between program elements, and between PCP's, have affected the evolution of the system considerably. At first it was thought that PCP's might be reviewed singly with the Services submitting them at any time during the year. Important proposals often reached OSD late in the budget cycle,

*Although we feel that program budgeting should be supplemented by cost-effectiveness analyses, it should be emphasized that in principle the two are separable. One could have the analyses in the absence of program budgeting, and one could have the formal machinery without analysis. In either case, however, some of the benefits would be lost. Cost-utility analysis has not been created in recent years; it has only been formalized. In a rough and ready manner the military services have always made use of cost-effectiveness assessments. Within the Services deep misgivings have arisen which reflect (1) the belief that on occasion the formalized techniques have been pushed too far, and (2) disagreement in measuring effectiveness with those in OSD. The Services should not permit doubts of such a nature to cause them to reject the substantial benefits that cost-effectiveness analysis can provide.

however, after changes of less worth had already been approved and "budgetary limits" had already been stretched. Moreover, in preparing proposals, the Services knew too little about the fate of earlier and related proposals. Because of such difficulties, it was decided to review the FCP's in related batches, but this still does not cope adequately with interdependencies or "ricochet effects." There are complaints that too few persons get to consider programs in their entirety, leading to "irresponsible" approval of FCP's and ultimately to deep Subject/Issue (now Program Budget Decision) cuts in terms of the old Appropriation categories. The growing awareness of the implications of interdependencies is indicated by the fact that Programs I (Strategic Retaliatory Forces) and II (Continental Air Missile Defense Forces) have been combined and are now considered as a single Program (Strategic Forces).

There is growing pressure to authorize application of single FCP's to related groups of program elements or even to entire Programs instead of having separate FCP's for each element. There is also pressure to authorize single FCP's for "issues" that affect particular resources, for it seems wasteful to have a series of bookkeeping "corrections" rather than one summary correction. Interdependencies also yield constant dissatisfaction with the program element structure, and it will no doubt be altered gradually. This structure is presumably to make use of categories having minimal interdependence, and it can no doubt be improved, but we should recognize that no format can fully eliminate interrelationships among Programs and program elements. They are there mainly because life is complicated, not because the program element structure creates them. If one postponed decisions until all interdependence could be taken into account, decisions would never be made.

Perhaps a more important factor shaping the system has been the following fact: to consider only the changes proposed in the FCP's is to look mainly at proposals that the Services believe it is judicious to submit. To get at the iceberg beneath the surface, pressure will grow to have annual reviews of Programs in their entirety. While this is more easily discussed than done the functioning of the system

may alter noticeably. For one thing the PCP may come to be explicitly regarded as a record-keeping and control instrument rather than an instrument to aid decisions. Despite efforts to improve PCP's, sequential and informal exchanges, special analyses, and non-quantifiable considerations are almost inevitably more important than formal PCP's in reaching decisions. Also if the Services are unable to provide Program reviews in a manner that is acceptable to OSD, one likely response would be the belief that there is no alternative to still more affirmative control by OSD.

Constraints on the Services are nothing new of course. Congress and OSD have never given the Services free rein and could not conceivably do so. Congress has long required a type of PCP -- the reprogramming requests for certain departures from enacted Appropriations. Economy-minded Secretaries of Defense have slashed budgets and vetoed Service proposals. Within the Services there have long existed networks of controls, with reporting systems to make resource shifts difficult and to help detect deviations from approved activities. But the new "revolution" in defense planning has added another layer of constraints, instituted a markedly greater degree of affirmative control by OSD, and extended the period of control from one year to five or more years.

Perhaps we should emphasize once more that the budgeting-programming system is not itself responsible for the centralization of authority. The new budgeting-programming arrangements and also the use of cost-effectiveness analysis by OSD have received a good deal of publicity and may have become symbols of the new regime. But the shift in power structure was clearly the main factor. The crucial decisions could have been made (though perhaps not as wisely) and enforced without program budgeting. Indeed, some monumental decisions were made in 1961 before the system was in operation, and since that time important choices have sometimes been reached before the relevant PCP's and the formal procedures had even presented the matters for decision. So the Services should not blame the mechanism for all the things they have complained about, nor should one credit

the procedures for all the improvements that may have emerged. At the same time the budgeting-programming arrangements, and other institutional reforms, do have consequences. Any change in organizational procedures will alter, to a greater or less degree, the structure of incentives within the system -- and, over time, will alter the ultimate outcomes. The five-year plan, for example, could have this result -- predisposing, even though not compelling, certain outcomes.

A few other highlights of the new order in defense planning should be mentioned, because they influence the impacts of centralization that will be discussed later. First, in judging the extent of centralization, it is probably significant that contractors seem to regard OSD as their real customer now. In internal documents prepared to help the management of one firm, it is bluntly stated that (1) OSD, not the Services, must be regarded as the customer, even when dealing through a Service; (2) all sales efforts should be oriented around cost-effectiveness analyses in terms of a specific mission or defense requirement. Second, OSD is centralizing (narrowing) the sources and the flow of military intelligence. The intelligence chiefs of the Services have lost their formal membership on the U.S. Intelligence Board. In addition, there is the more extensive use of independent agencies like DSA, DCA, and DIA, to manage certain activities centrally, with attendant reduction of Service responsibilities.

II. INTENDED BENEFITS OF INCREASED CENTRALIZATION AND INSTITUTIONAL CHANGES

No one would deny that, prior to 1961 there were many things wrong with defense planning. Improvements were desirable. And few would deny that the OSD "revolution" brought improvements from the Nation's standpoint. Some of the reasons for the increased centralization and institutional changes, or in other words some of the benefits that OSD aimed to produce, are the following:

A. BETTER COORDINATION OF INTERRELATED DECISIONS

In the nuclear age, interrelationships among decisions have become more and more important. What was decided about Polaris affected what should be done about Minuteman and the B-52. What was done about carriers could affect the costs or effectiveness of Army units. Decisions about the advanced development of Thor affected the worth of the development of Jupiter. Most persons, including voters and congressmen, agreed that force-structure and systems-development choices needed better coordination than Service bargaining provided. Perhaps there were other ways to make the bargaining process work better, but to most people steps toward more affirmative OSD control over these decisions seemed to be the best, or possibly only, way to proceed. Yet, even if this conclusion is accepted, it must be kept in mind that there is a wide spectrum of possible arrangements that would constrain OSD in different ways. At present, for example, Congress, the White House, and other Departments clearly put one sample set of constraints upon OSD choices. Many other patterns of checks and balances can be visualized.

B. BETTER CHOICES IN GENERAL

There was reason to believe that more efficient choices in general could be made. At least there were plenty of things wrong with the information that was available, the criteria that were used, and the decisions that emerged. OSD hoped to make better choices by

doing a variety of things -- among them, (1) looking at the full-cost implications of alternative decisions, (2) costing and thinking in terms of "programs" rather than "input-categories," and (3) considering alternatives and trade-offs systematically.

1. Looking at Full-Cost Implications

It is clearly sensible to look at the total costs entailed by alternative actions when choosing among them. When one considers selecting an item to be bought on the installment plan, one should look at the full-cost streams, not merely at the down payments. Yet with the conventional budget, the defense department had been choosing purchases frequently with the main emphasis on the "down payment," that is, on the first year's cost. In part the neglect of full costs by the Services and other persons was inadvertent, but in part it represented the deliberate attempt to get a foot in the door. In either case, once a system or a program was partially paid for, only the incremental costs were relevant, and these would naturally be smaller than the full costs. At that point the costs relative to the gains might make it economical to buy the program, even though the full costs relative to the gains would have made it an inefficient use of resources. The five-year financial plan was intended to compel defense planners to take full costs into account when making their choices. How much emphasis has really been given or should be given to those "program years" is debatable, but they clearly receive more attention than in the past.

By reducing the number of opportunities to use the foot-in-door tactic, OSD presumably hoped also to improve incentives within the Services. It was hoped, no doubt, that the Services would now find efforts to seek greater military effectiveness from budgets of given size more rewarding than devoting present energies and resources to the quest for larger future budgets. For, except for formal changes, the financial plan is set for five years ahead, and program change proposals have to include their full cost implications and be reviewed by OSD.

2. Costing in Terms of Programs

Presumably better judgments can be made about the size of programs or capabilities (which might be called "intermediate outputs") than about the number of particular inputs to buy for an entire Service. Costing and thinking in terms of Programs and program elements is no panacea, of course -- judgments are still difficult to make. But one can more nearly answer questions like, "Should we spend more or less for airlift or retaliatory capabilities?" than questions like "Should we spend more or less on military personnel for broad categories within the Air Force?" The latter decision depends upon what mix of capabilities is desired. Blue Book costs alone provide only moderate assistance because, as noted earlier, they do not show the costs of increments or decrements to various capabilities, and these are the costs that are relevant to most decisions. For this reason, OSD and the Services keep seeking ways to get prompt, even if rough, cost-estimates for perturbations in the Blue-Book programs.

3. Considering Alternatives and Tradeoffs Systematically

Another aim of OSD, intended to contribute to improved choices in general, was to consider tradeoffs systematically -- in light of costs and programs. Previously it had seemed that requirements or needs were often specified without regard for costs, and cost-limits or budgets were often specified without regard for needs. Now it is possible that bargaining between the need-firsters and the budget-firsters resulted in a better set of choices than would alternative arrangements; but to most people it appeared that there must be a better way. OSD's intent after 1961 was to reject the notions of unique requirements and firm ceilings for the individual Services (or components thereof) and instead to consider quite consciously the gains and the costs of alternative defense proposals.

If each Service proposal was to be examined on its own merits (in terms of costs and gains as compared with other alternatives), rather than in terms of a Service's total expenditures, then no Service

should be able to count on some specific share of the total defense budget. OSD may have had ball-park budgetary limits in mind, of course, but at least ceilings for the individual Services were not announced, and each one could hope to get a larger share if its proposals were persuasive. After a time the five-year financial plan imposed a firmer budgetary constraint than had ever existed before, but it was still not supposed to represent in any mystical sense an inviolable budget or requirement. If the gains from a change were judged to exceed the costs, in principle, at least, the change was to be made.

Again there is no denying that the previous system was imperfect. Alternatives and substitution possibilities were not compared systematically. Proposed programs were stated to be absolute requirements, implying that tradeoffs did not exist. Priority lists often put obviously important activities last on the list, again implying that everything was required and no tradeoffs were possible. Part of the difference between the old system and the new was semantic, because under the old procedures the bargaining process <u>did</u> yield departures from "absolutely necessary" budget ceilings and "absolutely essential" requirements. But the difference was not <u>all</u> semantic, and the new system did represent a change in attitude as well as a change in who made the decisions.

III. POSSIBLE COSTS OF THE NEW SYSTEM

There were then many unsatisfactory features to the old system. However, it would be invalid to reason that imperfections in the old arrangement automatically imply that the new one is better -- or that it is better in every way. One is obliged to look critically at the costs or imperfections of the new system as well as the old. Even though one regards the new system as superior, it is necessary to examine some negative repercussions of the new system which have received inadequate attention. While in light of an over-all appraisal, some may regard these as second-order effects, they should not be neglected. However rewarding existing reforms may be, further improvements can still be made.

In assessing change many observers are inclined to stress the more dramatic shifts in policy or even the stated goals of policy. They are perhaps especially prone to ignore certain costs -- e.g., of impairing incentives, of neglecting uncertainties, of placing heavy demands on delicate communications networks -- probably because these costs are so hard to measure. If such costs are neglected, people are in effect insisting that performance be improved or efficiency increased -- no matter what the cost! However, in such a view there is an underlying fallacy. Unless we look at full costs, we can easily be penny-wise and pound-foolish.*

*Several illustrations may be given of how the single-minded emphasis on a particular aspect of performance or cost may result in reduced efficiency or performance over-all. In portions of the value engineering effort, to cite one aspect of the cost reduction program, it is almost explicit: we aim to make contractors more efficient (in producing particular components) no matter how much it costs over-all. Incentive contracts, while valuable in many applications, can bring heavy costs in others. For example, tying incentive payments to a delivery date results in what the Russians call "storming" -- frantic efforts to meet the delivery date at the expense of anything not clearly constrained by the specifications (e.g., reliability, future deliveries, storage costs). Again the existence of bad effects does not tell one what to do -- but it does suggest that we must keep struggling to look at the full costs and full effects.

The issue most critically susceptible to the neglect of full costs is the degree of centralization in decisionmaking. The apparent benefits (in future avoidance of errors experienced in the past) are such that the tendency over time is to acquire additional layers of controls. The benefits are immediately obvious, but the costs -- in money, in time and energy, and ultimately in lost options -- are far less apparent, especially in the short run. Since this issue of "how much control?" is crucial to the discussion of costs, it is necessary to consider certain aspects of centralization which bear on striking the best balance in distributing responsibility between OSD and the Services.

o While terms like centralization or decentralization are freely employed, any particular arrangement within the spectrum of possibilities must involve some degree of centralization or, to look at the other side of the coin, some degree of decentralization. Wherever there is the possibility that sub-units may undermine over-all organizational objectives, there ought to be coordination.* Yet, on the other hand, no authority is so powerful that it does not have to bargain with anyone. Even aside from external organizations or higher levels (with their allies in one's own organization), any organization must motivate subordinate levels by providing an opportunity to influence policy. In the absence of such exchanges, the chances for eliciting the necessary cooperation and support are slight.

o In any given circumstances, there is no precise balance between centralization and decentralization which is "correct." In fact, there is an advantage in altering the balance from time to time simply to prevent organizational staleness from setting in. All that

*While the General Motors Corporation is frequently cited as representing an ideal of efficiency through decentralization, in point of fact the degree of centralized control in that case is usually understated by protagonists of decentralization.

one can say is that wherever there is even a moderate risk that over-all organizational objectives will be substantially undermined through "suboptimization" on the part of subordinate units, the case for sufficient centralization to reduce the risk of counter-productive clashes to an acceptable level becomes very strong. On the other hand, if there is little risk that a suboptimizing unit will substantially undermine over-all organizational objectives, the opportunity for substantial decentralization exists.* Action will depend on the effectiveness with which sub-units could perform their duties. One should note that the lower the costs of operations relative to the costs of communication or coordination under such circumstances, the more powerful is the case for decentralization. Speaking more concretely, for the expensive and interrelated force-structure decisions, major control at the center appears essential, but for inexpensive and independent R&D decisions which need not damage over-all objectives, the case for decentralization is powerful.

o Implicit in any organizational structure are risks of errors, both of omission and commission. The particular set of risks varies depending on the organizational structure. It is therefore not sufficient to show that a particular organizational structure creates risks; one must specify the area of risk and alternative arrangements which will reduce those risks. We feel that too much control may too easily be exercised over R&D activities -- control which is very costly in relation to total resources involved in the activities per se. Peculiarly in the development of new ideas must every effort be made to prevent the crushing of inventiveness -- and avoiding creative

*The fact that a lower level organization suboptimizes rather than acting in direct response to highest organizational objectives does not necessarily lead to harmful results. Officers working on a particular project or for an operating command need not ask themselves each morning how that project or that command relates to over-all national security objectives, no more than a businessman need ask each day what he is doing for GNP. It is certainly not essential, and may well be harmful, for someone with the over-all view to make all decisions. Bargaining processes in large organizations (like the price mechanism in the economy at large) can frequently turn private (suboptimizing) "vice" into public virtue.

talent being devoted either to anticipating what higher authority would like to hear or the attempt to communicate upward an unjelled idea. In R&D one wants great diversity and to avoid "consistency" like the plague.

o While in such areas as R&D decentralization should be fostered and exploited, the specific form that decentralization takes is not a constant. In particular, though the historical form of decentralization has been through the Services, it should not be assumed that this is the only form that decentralization could take in the future. Nevertheless, partly because of size and established structure, it is an obvious form. Since the predominant stress since 1947 has been in the direction of unification, integration, and coordination, it is perhaps desirable to recall that the original impetus toward decentralization reflected the inability of established authorities fully to exploit new military hardware and concepts. The establishment of USAF, for example, reflected the unwillingness of the older Services to take aircraft seriously as a new strategic system. New systems may be accepted too late, but one should not assume that decentralization will delay that acceptance. Germany's failure to press rocket development energetically may have cost dearly in the Second World War.

o The Office of the Secretary of Defense, it should be recognized, is not monolithic. Substantial decentralization (and controversy) exists within it. DDR&E is visibly a center of independent power, and between it and the Comptroller's Office, for example, there appear to be frequent divergences in view. Nevertheless, one would be wise never to assume too wide a divergence within any single organization. Most public or external discussion will inevitably constitute a defense of the policies adopted by the organization. To be sure, internal discussion can reveal significant differences. Under the best of circumstances, these differences will be keenly marked. Nevertheless, for the most part, individuals within any organization will reflect either the personality of the organization (if based on a permanent cadre) or the views and the personal style

of existing leadership (if there is mobility into and out of the organization). In the long run divergences based on differing interests are most effective in divulging differences in ideas.

o Just because activities are controlled by the separate Services does not necessarily imply that there need be decentralization -- unless appropriate steps are taken. The Services separately and even jointly may be dominated by one view. In the fifties this was roughly the case. Decentralization through the services is feasible, but it is not inevitable. Existing controls, in fact, make beneficial decentralization difficult to achieve.

Given these observations, let us turn to the new OSD system, keeping in mind that it is not a single package to be considered on an all-or-none basis. Though many parts of the system may provide substantial advantages, others may yield net disadvantages. It is these features in which we are interested, for here the opportunity exists to obtain further improvement -- through the modification of costly or disadvantageous techniques.

Our major concern is with longer-run effects, including effects one might anticipate as successive sets of OSD officials take over the reins. It cannot be foretold how much military insight future generations of civilians in OSD will possess. If forced to hazard a guess, one should assume that familiarity with military issues will remain at a much higher level than has historically been the case. What does seem certain, however, is that the energy and imaginativeness of OSD personnel will decline. What has occurred in OSD is not dissimilar from what occurred during periods of creation or transformation in other government agencies and departments. The challenge of change attracts individuals of extraordinary merit. When creative fervor wanes, such individuals go elsewhere. As persons with lesser over-all ability inherit the system, lacking experience in its creation and in the reasons for change, the nation may reap fewer of the benefits and begin to incur heavier costs. To be sure, under any system a decline in ability will tend to reduce performance, although de facto decentralization, flowing from reduced ability at the center,

may mitigate the effects. Nevertheless, a system placing a disproportionately high premium on the imaginativeness of a few critically placed men is peculiarly vulnerable to a decline of ability in men in key positions. Moreover, many benefits of the new procedures have depended upon considerable indifference to politics on the part of Pentagon decisionmakers -- a condition which cannot be assumed to be permanent. On the contrary, major cabinet positions have on occasion gone to purely political appointees, and rarely to men who cannot be swayed by political considerations. Moreover, when men enter office determined to resist political pressures, as the years progress they acquire commitments which very much reduce their flexibility.*

Since the emphasis in this Paper is on long-run costs, most of them remain as yet either invisible or barely discernible. For the time being we are in no position to indicate how important these costs are, or in some cases whether they really exist. Indeed, even in the future, no one will be able to demonstrate rigorously how serious these costs are. They will take such forms as "too few" alternatives being considered or "too few" hedges against uncertainty being adopted, and since nobody can show conclusively what is correct, they cannot show conclusively what constitutes "too few." For these various reasons, we cannot present measurements -- we can only present the arguments for consideration. Also, even if, on the basis of these arguments, one judges that modifications of the OSD system are in order, how far to go requires a still more difficult judgment.

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*The Navy version of the TFX fighter is reported to be overweight, causing considerable difficulty in both takeoff and landing on carrier decks. The Navy is reported as wishing to acquire the F-4C in larger numbers as a substitute. Given the earlier commitment of the OSD both to the concept of what was originally the tri-service fighter (later the Air Force-Navy fighter) and to "commonalty" as the criterion for selecting a contractor -- in addition to the lengthy and heated controversy touched off by the award to General Dynamics -- the possible embarrassment to OSD makes it improbable that OSD would accept the Navy's view irrespective of cost-effectiveness considerations. As a general rule, one may observe, it is easier to cancel commitments made by earlier decisionmakers than it is to cancel one's own.

THE THREAT ENVIRONMENT AND THE ORGANIZATIONAL STRUCTURE

Moreover, it is important to recognize that the optimal decision-making structure for the military establishment varies with circumstances. In this respect the determining element is the way in which the threat environment is perceived. For planning under all but the simplest conditions by far the most important considerations are the existence of uncertainty and the mechanisms designed to deal with it. In defense planning lack of precise knowledge regarding present or contemplated actions on the part of potential rivals, reinforced in recent years by the rapid change in military technology, accentuates the role of uncertainty even above that prevailing in ordinary planning.

Under some conditions the relative stress placed in military planning on the ever-present uncertainties may diminish. Whenever a specific threat has very high probabilities ascribed to it or whenever such a threat despite lower assigned probabilities appears overwhelming in its consequence, a concentration of effort on that specific threat is both likely and defensible. Something of this sort did take place during the middle and late fifties and continued into the early years of the Kennedy administration when widespread concern existed that the Soviets were striving to attain strategic superiority. Under these conditions many uncertainties were neglected, including those revolving around "lesser" threats, and the bulk of American activities centered around the countering of what was perceived as the main threat. When such considerations apply, centralization may have a larger role to play, and the suppression of alternatives that may accompany centralization may be viewed as a lesser cost.

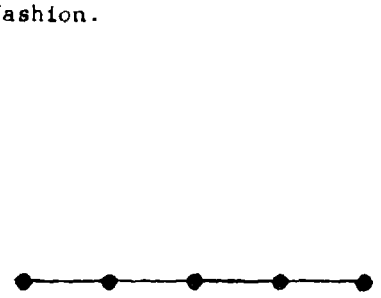
The current threat environment bears little resemblance to the one just described. There exists a variety of threats which could be posed by the Soviet Union, China, or possibly others. None appears sufficiently probable, or potentially so overwhelming in its

consequences before we could respond, to justify the procurement of expensive new systems as countermeasures. With time and the improvement of our ideas, it seems probable that more effective countermeasures to any such threats can be devised at a later date. The existing threat environment calls not for costly crash efforts to counter dominant threats but the maintenance of an across-the-board program consisting of numerous and austerely-conducted projects providing us with future options quickly to counter whatever specific threat does materialize. Such an objective can be undermined by too much centralization which results in a premature screening process and/or in disproportionately heavy outlays for organization and communication. Particularly in an environment dominated by a range of relatively distant and imprecisely formed threats is decentralization desirable for that permits investigation of the technical feasibility, processes, and costs of new hardware ideas before subjecting the latter to the withering blast of specific mission requirements or conformity to existing doctrine.

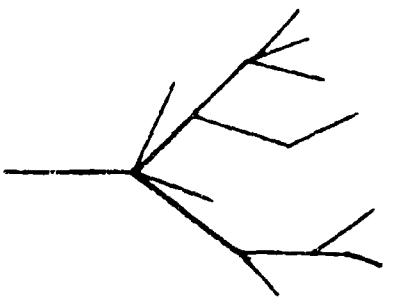
THE APPROPRIATE PLANNING CONCEPT

Given the grave uncertainties which are ubiquitous in defense choices, what kind of attitude should be taken toward planning by decisionmakers at all levels (save in the operating commands)? What concept of planning is appropriate not only in OSD, but in the Air Staff, the Air Force Systems Command and the like? Above all, it should be a concept that is conducive to (1) facing uncertainties (not pushing them aside) and (2) hedging against uncertainties (i.e., not biased against hedging). Plans should be based upon an accurate appraisal of the future -- and an accurate projection is that future strategic contexts are unclear, future technology is uncertain, human judgments are fallible, performance of systems is never certain. In such a world we need not Cook's-tour planning, which rests on the view that the future is sufficiently certain that we can chart a straight course five years ahead, but rather what we shall call Lewis-and-Clark planning. In the latter case we recognize that there will be many

forks in the road and many alternative courses of action, but their precise character and timing cannot be anticipated. At the end of a period we can look back on the paths pursued which include many abandoned experiments, many hard (and possibly erroneous) choices, and the like, but we could never have anticipated which options would be chosen, when the choices would be made, and how long alternate courses of action would be pursued before abandonment. Retrospectively what took place may be mapped (as in the diagram), but the planning function is not to chart a precise course of action, rather it is to prepare to deal with the uncertain terrain of the future, to note the signs in the environment that a decision point has been reached, and to respond in a timely fashion.



Cook's-tour planning



Lewis-and-Clark planning

In bureaucracies decisionmakers are continually tempted to go too far in the quest for Cook's-tour planning. This can be done only at the cost of neglect of uncertainties, lost flexibility, neglected and suppressed options, and less-than-optimal adjustment to changing opportunities and threats existing in the external environment. In evaluating any planning procedures, we must be on guard against the tendency to exaggerate the extent to which the future can be foretold and planning for it precisely charted. Modifications can be introduced into a system which will permit greater recognition of uncertainties and enhanced flexibility in the face of change. At times organizational requirements may necessitate the tentative outlining of a Cook's-tour plan, but under such circumstances a major effort should be made to highlight in the minds of all concerned that the proposed arrangements remain tentative.

IV. CONSEQUENCES OF CENTRALIZATION: SOME HYPOTHESES AND PRELIMINARY EVIDENCE

In this section two questions are dealt with: (1) a hypothetical treatment of the impact of centralization, and (2) a tentative analysis of the impact of the new procedures in specific decision contexts. The first issue is itself subdivided under three headings: (a) the ultimate suppression of alternatives, (b) neglect of relevant impacts on cost or effectiveness, and (c) neglect of uncertainties. It should be stressed, however, that these three are not separate elements but rather facets of the overall problem of centralization. They are thoroughly interconnected and no precise dividing line can be drawn. Because of these interrelationships no attempt is made to classify the subsequent discussion of the effects of centralization in specific decision contexts -- i.e., studies, R&D force structure, etc. -- under these subheadings. In each case the precise weight that might be attributed to (a), (b), or (c) will vary. Finally, while the discussion is couched in terms of the effects of OSD centralization, it must be emphasized that the tendencies described exist in all cases of centralization. The services themselves have in the past provided striking examples of these tendencies.

THREE HYPOTHETICAL EFFECTS OF CENTRALIZATION

a. Ultimate suppression of alternatives. Although OSD may set out to examine alternative actions systematically, there is danger that the system will work to shorten the list of alternatives that are seriously entertained.* Consider the way issues are decided when major (and many minor) choices are made by OSD and when the bargaining

*Reflecting extensive experimentation by social psychologists it has now become almost a commonplace that a centralized communications and decision-making structure permits more rapid achievement of consensus and more rapid making of decisions through the suppression of disagreement and of deviant expressions of opinion. On this point, see for example, P. M. Blau and W. R. Scott, Formal Organizations, 1962, Chandler, pp. 125-128, 131, 134, 139. This manner of eliminating alternatives is reinforced in a hierarchical structure by self-censoring and the suppression of ideas on the part of lower echelons.

strength of dissenters is drastically reduced.* First, the views of one group will face fewer checks and balances and will play a greater role than before. In most of the big choices, there are no demonstrably correct answers eliminating the need for heroic judgments. Judgment has to be decisive. Any small group will be inclined toward certain views -- their exact substance does not matter. Suppose, as hypothetical examples, the small group favored increasing our commitments in a particular theater, or suppose it favored decreasing our commitments. Suppose it was stubbornly convinced that a particular weapon systems concept was the only answer or, on the other hand, was doggedly opposed to it. Centralization of authority would tend to foreclose serious consideration of alternatives that inter-Service bargaining would air more seriously.

Since "inter-Service rivalry" is treated in this paper as one route through which benefits of decentralization may come, it seems advisable to say a few words regarding what such rivalry may reasonably be expected to accomplish and what it should not be expected to accomplish. If one were to expect thoroughgoing and rigorous competition among the three Services -- along the lines of the traditional competitive model -- one would be doomed to disappointment. The three Services should be expected to exhibit the kind of competition which typically exists "among the few" when there is recognition of mutual dependence. One would expect the "competitors" to recognize elements of both rivalry and cooperation in their relationship, to establish a pattern or code which limits rivalry, and to be forbearing in their relationships in the sense of avoiding disturbance of that pattern through frequent and direct assaults on one another. Moreover, (and this runs against the grain of OSD's intention of fostering competition among the Services), the existence of a powerful "outsider" who intends

*Many of these points were discussed several years ago in the very perceptive paper by Alain C. Enthoven and Henry S. Rowen, "Defense Planning and Organization," in Public Finances, Needs, Sources and Utilization. A Report of the National Bureau of Economic Research, Princeton, N.J., Princeton University Press, 1961, pp. 365-417.

to exploit divisions between the "competitors" may actually encourage them to close ranks -- particularly is this so when conflicts of interest can be passively passed up to higher authority for decision, thereby avoiding open ruptures.

What one can expect from such rivalry, even when modified by recognition of mutual dependence, is that each Service will harbor diverse and divergent ideas on major national security issues. Such conflicts may normally not result in overt clashes, but are nonetheless valuable. Such pools of concepts diminish the risk that dominant but obsolescent ideas will persist too long without challenge. On rare occasions conflicts will be brought into open controversy -- with enormously beneficial effects on defense policy. The B-36 carrier controversy is, of course, an example frequently cited. A more recent example, and one perhaps more revealing of the potential benefits, is the resistance of the Army throughout the later fifties to the heavy emphasis on general war capabilities and especially to the sharp reduction in capabilities for limited warfare. Leading defense officials since 1961 have repeatedly underscored their belief that the Army's earlier contention was correct and of utmost importance. Yet, the effect of restructuring the Department of Defense certainly is to diminish the chances that a position like the one regarding limited war capabilities can be presented with similar effectiveness in the future.

Finally, one should not assume that the kind of limited rivalry exhibited by the Services is one that applies exclusively to them. There is plenty of evidence that the subunits of the OSD have recognized, as they must, the interplay of rivalry and cooperation in running themselves and govern their behavior accordingly. There are exactly the same kind of tacit agreements to avoid continued controversy and to recognize areas of dominant concern that exist among the Services -- or under any organizationally similar conditions.

In the long run, inter-Service rivalry and criticism are probably better than good intentions at flushing out new alternatives and

criticizing obsolete activities. Numerous illustrations may be cited. The most dramatic example, however, is that of the Polaris weapon-system. The conception of the system and the determination exhibited in its development is in large measure attributable to the Navy's special interest in developing a competitive strategic system in the missile age. The beneficial effect on over-all security is clear. Yet, there is reason to doubt whether under the new system, approval could have been obtained and development energetically pursued. Especially is this so in light of the exacting scrutiny on the basis of cost-effectiveness calculations of new mission concepts very early in the development cycle. The heavier the reliance on one group's views, the greater the risk of neglecting alternatives.

Second, with greater centralization, simplification of the task of choosing and controlling becomes imperative. Affirmative control or the attempt to exercise such control in an organization as large as the Department of Defense requires arraying the alternatives quickly, focusing on the main considerations quickly, and making choices quickly. All this means the rapid screening and disposition of alternatives and the use of rules of thumb to help with this task. In other words, the pressures on a small group at the top make the cost of fully exploring numerous alternatives high, and eventually the quest for alternative solutions is likely to become less eager.

Third, the incentives at lower levels, i.e., within the individual Services, to invent alternatives may be dulled.* They are constrained by lack of authority to make innovations, and, if they are reasonable, will find it less rewarding than before to think about innovations. Change is inconvenient, and designing possible innovations takes effort; the lower the rewards for this activity and the greater the pressures for other activities, the less the effort that will be devoted to designing alternative courses of action. In these circumstances, it may eventually seem more rewarding for the Services just not to rock the boat.

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*That the military services have not always displayed their present enthusiasm and vigor in pursuit of new military technology is suggested by the following quotation from James B. Conant, Modern Science and Modern Man, Doubleday Anchor edition, 1952, p. 116:

> In 1940, those of us who were in Washington as civilians were concerned mostly with the technological conservatism of the men in uniform. I will relate no stories to prove the point. The conflict between the professors and the "brass" is too well known. Most of the versions do less than justice to the military man and give too much credit to the professor. Be that as it may, what I am concerned with is not the technological conservatism of the men in uniform in 1940 but the almost fanatic enthusiasm for research and development of their successors in 1952. It is a phenomenon not unlike that of an old-fashioned religious conversion.

It should be a continuing concern of the Department of Defense to maintain initiative in the Services and forestall a return to a traditionalist attitude toward changing military technology. A key element in preserving an initiative attitude may be the full participation both in R&D and in weapon-system selection.

b. Neglect of relevant impacts on cost or effectiveness. In choosing among weapon systems or other alternatives, one always risks neglecting relevant impacts on costs or effectiveness. At best they are hard to perceive and measure. A decade or so ago many people thought the effectiveness of U.S. retaliation forces was adequately reflected by their ability, undisturbed by an enemy strike, to inflict damage on that enemy's installations or economy. Gradually it was recognized that vulnerability of U.S. forces had much to do with their effectiveness or deterrent capability, and also that the character of nuclear striking forces had much to do with the deterrence of minor aggressions, with the course and outcome of a war should deterrence fail, even with the chances of reaching acceptable weapons-control agreements. Thus crucial impacts on effectiveness, and also on costs, are often difficult to anticipate.

How might centralization -- in the long run -- add to this difficulty? First of all, if the views of one group ever dominate the debate sufficiently to make the expression of dissenting views ineffective, it could reduce the likelihood of all effects of alternative systems being aired. For it was mainly voices of dissent, not sophisticated management, that finally made us face additional impacts of alternative strategic capabilities. Just as one group is likely to consider a narrower menu of alternatives than would a multiplicity of groups, one group is also likely to recognize a narrower range of effects than would a multiplicity of groups.

Now so far a variety of views are unquestionably being expressed. The Services forcefully present their positions, pointing out considerations regarding strategic or tactical forces that they fear are being neglected. Outside criticism still calls attention to effects that outsiders believe are underemphasized. But in the long run centralization could diminish the extent to which dissenting positions are presented. How much dissent is it desirable to preserve? Presumably no one knows in any precise fashion. All one can say is that the dominance of one set of biases instead of competition among several sets of biases could be very costly.

What about systems analysis or cost-effectiveness analysis? -- won't such comparisons of alternatives insure that we perceive all costs and all effects? Properly used, systematic comparisons can help enormously. Systems analysis was and is intended to help reveal all impacts on costs and effectiveness, not merely by quantifying some of them but by forcing us at least to recognize the others. It does not guarantee this, of course. Biases, e.g., by the Services, can distort the analyses, though inter-Service competition may help expose distortions or gaps. Also, quantifying certain effects may blind the unwary to extremely important non-quantifiable considerations. There is always a legitimate question as to whether quantitative analysis is helping or hurting. To that question one leading defense official has provided the following answer: "My general impression is that the art of systems analysis is in about the same stage now as medicine during the latter half of the 19th century; that is, it has just reached the point at which it can do more good than harm, on the average."* In this light it is clear that analyses should serve only as an aid to decisionmakers, who should avoid applying or appearing to apply analytical findings mechanically. This is particularly true since analyses, like medicines, vary in quality around "the average," and the quality of individual analyses is hard to assess, and, also, since quantitative analyses, like medicines, may be helpful in some problems and damaging in others.

A review of any good cost-effectiveness analysis will show how analysts must grope their way toward relevant costs and gains of the alternative systems.** No one says, "Here is the objective, these are the three alternatives, one part of the team will cost these alternatives, and another part will trace out their effectiveness in

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*Address by Deputy Assistant Secretary, Alain Enthoven, before the Naval War College, Newport, Rhode Island, June 6, 1963.

**For one of the classics, see A. J. Wohlstetter, F. S. Hoffman, R. J. Lutz, and H. S. Rowen, Selection and Use of Strategic Air Bases, The RAND Corporation, R-266, April 1954.

achieving the objective." What really happens is constant interaction that keeps modifying ideas about objectives, the alternatives, and the costs. As the work proceeds, dissent and discussion reveal that objectives other than those first considered are affected by the various systems. As a consequence, measures of effectiveness change, and the alternatives are redesigned. As rough cost estimates are prepared, someone may realize that particular features of a system increase costs greatly yet may not contribute much to effectiveness, and the alternative systems are redesigned. As effectiveness is explored, it is realized that certain new features might contribute greatly to effectiveness yet cost little, and the alternatives are redesigned. Indeed, it may appropriately be said that the real contributions of systems analysis have been the invention of new ideas and the appreciation of additional impacts (growing out of the examination of clashing views) -- rather than the final cost-effectiveness exhibits.

Viewed in this light, systems analysis can be of considerable value in uncovering well-hidden considerations bearing on cost or effectiveness. But systems analysis provides no panacea. First, there must be full appreciation of the role of groping and criticism in providing relevant and up-to-date answers in a complex and ever-changing world. Moreover, there must be recognition that measurement is not the final criterion and that many important questions elude quantification. This skepticism regarding the quantifiability of defense problems is unfortunately not always present; sometimes the rhetorical question is absent: "What else can one do but <u>measure</u> to the best of his ability? What is a better alternative?" The answer is that of course we should try to make use of relevant measurements yet also to recognize that measurements have varying degrees of relevance, that there are nearly always relevant considerations that cannot be quantified, that life is tough and choices are hard. To use a simple easy basis for making inherently hard choices is to use a wrong basis and make wrong choices. Cost-effectiveness should be regarded only as an aid, sometimes only a slight aid, in reaching decisions.

It may reasonably be asked whether the current generation of OSD practitioners will forget the limitations of systems analysis. Insofar as the new techniques are their own creation and insofar as it may be assumed that quantification can be pushed beyond its proper boundaries, there is some danger. Undoubtedly, however, the main danger lies in the longer run, when the public or some new OSD management may have formed an erroneous concept regarding how much cost-effectiveness analysis can accomplish. By then analytical techniques may have become formalized -- and may be regularly misapplied. There is even danger that studies will retrogress toward the asking of the very type of partial and oversimplified questions that provided the impetus for the development of systems analysis.

Even, in the short run, problems of this type are fostered by centralization. There is cause for concern in the fact that OSD serves in the twin roles of advocate and judge. Every organization exhibits a natural tendency to put its best foot forward. When the Services in the past wanted to sell or defend a program, they bent every effort to make it look good. This effort included a judicious amount of undercosting, but rivalry and criticism often brought this to light. However, OSD itself may have favorite systems that it wishes to introduce or, once introduced, to defend. Officials may overstate effectiveness or understate costs.* Since the relations between the OSD and the Services are not symmetrical, the latter are both reluctant and more restricted in their ability to expose erroneous calculations. The less the extent of criticism and competition, the less likely it is that these errors will be brought to light. Shielding analyses from effective bargaining and criticism would in the end result in their being used to justify particular preconceptions and emotional commitments.

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*The treatment of Minuteman could be a revealing case in point. There is reason for speculating that more than a coincidence exists between the fact that there has been continuing and very serious undercosting of the operations and maintenance costs for Minuteman and the fact that the latter has been a much preferred weapon system for OSD.

c. Neglect of uncertainties. One extremely troublesome and important problem which exists in all decision-making structures, but which could be intensified by centralized planning, is the treatment of uncertainties -- uncertainties about future strategic contexts, about the functioning of systems, about actual operations, and so on. Might not such uncertainties be neglected in the long run? The same forces noted earlier could help bring this about. The judgments of one group would not be likely to take seriously as many contingencies and uncertainties as the judgments of several groups. One group might have particular convictions regarding Missile A's performance or about the likelihood of war in Europe and might make choices as though there were relative certainty. If other groups have bargaining power and can therefore make their judgments felt, more of the true uncertainties may be forced into the picture, and decisions may be made with full awareness of their existence.

Also, as noted before, with greater centralization it may become imperative to simplify the task of choosing, and one tempting route to simplification is to neglect uncertainties. This is particularly so when OSD (with its role as advocate) is making the case for a particular solution to a problem. But, even at best there is a very natural human reluctance to face inherent uncertainties -- all of us try to find a number, a formula, a half-page summary without messy qualifications. We often need some kind of force to compel us to recognize contingencies and variable outcomes. Without enough bargaining pressures, a group can put too high a premium on simplifying choices.

Finally, the incentives of the Services to recognize and hedge against uncertainties may be dulled. For example, how would one expect the Services to react to the Blue Book rules? To a greater extent than before, the Services must live with their cost estimates. With OSD control they have an incentive to estimate costs accurately several years ahead and to avoid "overruns." From most standpoints, of course, this is desirable. But it does bring a cost. It is likely

to foster the exploration of relatively "safe" or "conservative" proposals and a neglect of radical ideas, hedging against contingencies (where the gains are highly uncertain), and long-range planning (where uncertainties abound).* No one can say just how much speculative thinking and hedging is "correct," but if we want to increase it over the long run, decentralization probably would work in that direction.

With costs supposed to be nailed down five years ahead, consider how a Service is likely to reason. Consider a proposal whose worth would be huge if certain contingencies occur or if technological problems can be solved or if certain loopholes can be filled. These facts mean that there are numerous possible outcomes. Some uncertainties can be resolved at a cost, e.g., by parallel R&D approaches, or by modifying the system to make it function better in a wider range of circumstances. But including these costs appears to make the proposal more expensive and also may make it sound as though one does not know quite what one is doing -- which is true. This makes it less likely that the scheme will be accepted. Also, even if accepted, the proposal might later involve "overruns," which are not merely embarrassing but may entail cutting back on some other program. The Service's choice may be, not just to consider these uncertainties, which certainly should be taken into account, but to advance invariably the more cautious proposals. In deciding what combinations of proposals to press for, the Services will take into account the chances of acceptance, the effect on the prospects of the items they especially desire, the future difficulties that may be entailed.

The tendency to neglect uncertainties is deep-seated in all organizations. In so vast a structure as the Department of Defense, it must be resisted at all levels -- not only in the OSD, but in the Services as well. The forces we have discussed were at work within the Services long before 1961. Uncertainties were neglected, but

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*This kind of "safe" bias in proposals may lead, of course, to highly "unsafe" gambles as some of the contingencies do in fact materialize.

each Service was inclined to neglect a different set. Rivalry among them often forced each to worry about contingencies, to explore off-beat ideas and parallel approaches, to take a chance on risky proposals. The danger is not only that the OSD will neglect uncertainties, but that the new procedures will lessen the incentives for the Services to be alert to uncertainties and to develop measures for dealing with them. A genuine, though partial, dispersion of power -- for example, giving the Services and possibly the Unified Commands some untrammeled funds for R&D -- may in the long run be well worth the cost.

IMPACT OF THE NEW PROCEDURES IN SPECIFIC PROBLEM AREAS

Emphasis in the preceding section by necessity has been directed toward centralization's longer-run consequences. But the long run is not wholly separate from the short. It would seem plausible to assume, therefore, that on the basis of three years' experience with the new system certain preliminary indicators of the suggested dangers would have appeared and that we should now be able to designate major problem areas. In this subsection the effects of the new procedures in specific decision contexts are examined in greater detail. Since the long-run problems previously discussed are wholly intertwined, no attempt is made to isolate cases in which alternatives may have been prematurely suppressed from cases in which uncertainties were ignored.

1. Studies

If the approval of studies is controlled too closely by one group -- and it could be any group -- the kinds of effects we have discovered should be anticipated. Judgments about what things are worth studying will reflect one group's appraisal of the future. Some ideas will be discarded because only certain pictures of disarmament, future strategies, or alignment of nations are believed to be in the cards; some technological advances will not appear to be worth thinking about because they are judged to be too costly or impossible. Yet there is vast uncertainty about most of these matters,

and a multiplicity of judgments is likely to reflect that uncertainty more accurately.

Although relatively inexpensive, as defense alternatives go, studies are also relatively unattractive to most administrators, because individually studies are long-shots. If they are judged as a means of exploring a single group's ideas about strategy, the screening process can be rough. Nobody would think of applying cost-effectiveness analysis to studies, yet detailed justification and screening by one small group may have a somewhat similar effect. Studies will be chosen which in their view offer obvious prospects of success. Studies that involve costly attempts to resolve uncertainties or those that promise uncertain (even though large) gains are unlikely to survive. There will probably not be much sympathy for "pipe-dream" studies -- say the possible new military implications of space. If OSD controlled study choices (or other choices) too closely, the Services might gradually lose incentives to make long-range studies.

Although mainly concerned about the future, some of these things seem to be occurring now. Money for the study of possible defense activities in space or of other futuristic ideas has apparently been rather hard to get. In the early years of the new administration, references, both dire and facetious, were made to the so-called "Study Gap." While the phrase may have been too melodramatic, it did point to an important reality: particularly in certain areas that officials judge to be unpromising or off limits, study approval is subject to both serious risks and delays. Already there is a tendency to concentrate on studies that look good, i.e., about which people already have enough information to show that they look good and about which there is therefore less uncertainty. Already the Services seem to be showing battle fatigue and losing some of their zest for long-range thinking.

There is an additional problem: within any bureaucratic structure pressures exist to force analyses of alternatives into design studies.

Within each Service, for example, after a study of alternatives is begun, participants and successive echelons of reviewers perceive that certain of the alternatives are frowned upon by higher-level officers. It seems useless, perhaps even hazardous, to make the full case for the unpopular alternatives. Gradually the case against these alternatives is stressed more and more, or they are dropped from the picture altogether. The project turns into a design study -- the design of one "required" system rather than an objective comparison of alternative systems.

The existence of the several Services implies, however, that on major issues several alternatives may survive the screening process. If the Services exert little influence, however, OSD studies may ultimately become the only mechanism for exposing alternatives. But they too may turn out to be design studies. Participants and echelons of reviewers will recognize what top management wants. If the highest levels are indifferent, subordinates will support their own preferred courses of action, and those preferences will be perceived by the ones who prepare and review the study. The long-run outcome may be, as it often is within the Services, design studies rather than objective comparisons of alternatives. The popular course of action may be compared with "straw men," or the unpalatable alternatives may simply drop out of the analysis altogether.

2. Research and Development

If we look to the future and for the means to hedge against its uncertainties, the R&D program (at least in light of the existing strategic balance) may be considered even more important than immediate outlays on forces. In a sense the R&D program represents the future force structure. More than that, it provides the options for modification and adaptation of existing weapon systems to exploit new technology, to counter new threats, or to seize new strategic opportunities. When we look toward the future any tendency to suppress alternatives becomes virtually synonymous with the failure to deal with certain classes of uncertainty. The R&D program should be designed to create and maintain as broad a spectrum of options as possible -- some of which

will prove to be optimal in as-yet-undetermined future contingencies.

If the costs of individual R&D programs were equal under OSD-centralized or Service-decentralized structures, it could be said with some confidence that in the long run the range of alternatives emerging from the study program and receiving serious R&D attention would be narrowed under centralization. For under centralization all proposals after going through successive screenings must pass finally through a one-group screening. If the Services had more authority over the use of R&D funds, proposals could be accepted if they passed through any one of three different screens. Whatever the disadvantages of the latter arrangement, it seems likely to have one advantage -- the exploration of a wider range of alternatives.

However, there does exist the usual tradeoff between cost and quantity. The more costly the individual development activity, the fewer the number of developments that can be carried on. Thus the case for decentralized R&D activity is powerful only if the Services can conduct individual activities on an austere basis, thus permitting the exploration of multiple viewpoints. The belief is widespread that in fact the conduct of R&D activities under Service management has been the reverse of austere. It would appear that a substantial reduction in the costs of major R&D efforts is indispensable both in obtaining the benefits of decentralization and in providing a convincing political case for decentralization.

If one were persuaded that the costs and the supply schedule for R&D activities under unfettered Service management were under good control, one could argue more persuasively that demand "coordinated" by the OSD tends to be more narrowly restricted than the joint demand on the part of the Services. The problem of uncertainties is particularly serious. The tendencies discussed earlier -- reliance on the judgments of fewer persons, the need for making hard choices simpler and easier, the incentives to avoid uncertainties within the Services

and among contractors -- are likely to yield more cautious proposals and more severe screening of proposals. Is this bad? Well, it depends on how far it goes. At the extreme, only well-understood ideas could be justified and explored. With enough central control, the Services too would turn even more diligently than at present to central screening; proposals and changes would be reviewed to death. No one would make obvious errors, but no "unsure bets" would be placed. We might be highly efficient as far as the existing range of possibilities was concerned, but doing little to increase the range of possibilities.

Again, it may be asked whether cost-effectiveness analysis and a detached scientific approach to R&D choice will save us. Wouldn't it be better than institutional arrangements to promote bickering and a diversity of explorations? Again it is a matter of how far things go. But some basic features of cost-effectiveness analysis ought to be more widely understood. As an aid and only an aid to decisions, good cost-effectiveness analyses need not blind anyone to uncertainties. The greater the degree of uncertainty, of course, the less conclusive the findings of such analysis, and the more warily those findings must be employed. Nonetheless, there <u>is</u> danger of misusing cost-effectiveness analysis when applying it to R&D choices, and if one group has most of the bargaining power, the cards are stacked in favor of ultimate misuse. If employed carelessly or hurriedly, cost-effectiveness analysis can foster the neglect of uncertainty. It calls attention to costs and gains you know about, but cannot call attention to those you don't know about. Yet in R&D many costs and gains fall into the latter category.

For example, specifying objectives has to be done for cost-effectiveness analysis, yet it is hazardous. In choosing among deterrent postures, a good deal of stumbling occurred before it was realized that a second-strike, not merely a first-strike, capability was one of the main objectives. Only gradually was it then perceived that the deterrent posture also affects the achievement of other vital objectives. There is usually no "correct" mix of objectives, but one had to use particular mixes for analyses. Sensitivity analyses can help us avoid forgetting about tradeoffs and uncertainties, but that help

is limited. Fully as important, no one knows exactly how proposed developments would affect the achievement of these objectives. Nothing is wrong. It is the best we can do, but we must remember that our best is none too good. There <u>are</u> multiple objectives, there <u>are</u> tradeoffs among these objectives, there <u>are</u> uncertainties, and heroic judgments <u>must</u> be made.

Along this same line, if the only way to justify even advanced developments is to link them with specific requirements or objectives, some worthwhile projects are certain to be eliminated. Insistence that missions be specified prior to development work will lead to too narrow an R&D menu. As others have noted, prior to the use of the wheel, people might have been hard pressed to spell out important requirements for it. We could appropriately tie R&D proposals to recognized missions if the latter could be fully spelled out. But given our ignorance of the future, two missions that ought to be recognized are (1) acquiring information, and (2) hedging against contingencies. These should be written into every cost-effectiveness study in capital letters, because in real life they are among the most important military requirements or objectives. Even engineering and systems developments affect these objectives. Even after components are allegedly developed, putting them together often involves great uncertainty and yields valuable information. The Defense Department obtained important knowledge from Navaho, Skybolt, and many other "failures." That is not to say that they were the cheapest ways of getting the knowledge. Nor is it to say that stopping them was wrong. On the contrary, the point is that there are great uncertainties and there should be occasional cancellations. If there never were any, even in operational systems development, something would be wrong.

To come back to the main point, screening of R&D proposals that relies heavily on cost-effectiveness can bias us against developments that involve great uncertainties, yet some such projects are extremely important. The DoD directive regarding Project Definition (No. 3200.9) places considerable emphasis on the use of cost-effectiveness in deciding what projects can go into Project Definition and thence

into engineering or systems development. There is nothing wrong with using good information in reaching this decision. Moreover, making it harder to get a system approved may, if other circumstances are propitious, induce the Services to give more attention to components in exploratory and advanced development. (Sometimes the Services may have felt that proposing certain component developments reduced, or at least postponed, their chances of getting a full-system commitment.) Coupled with a slight dispersal of decision-making power, this project definition arrangement could work out well. Coupled with a high degree of centralized control, however, it is very likely to result in premature screening of alternative approaches.

Moreover, in addition to the direct effect of DDR&E screening of research proposals, tighter OSD controls over procurement, force structure, and operational decisions may ultimately make the Services less concerned in general about research. Will a Service continue to be as keenly interested as at present in basic research, systems analyses, or exploratory R&D -- when the findings affect decisions that are to be made by someone else? Or will the Services gradually become more interested in studying choices that are still open to them? If so, the centralization may in the long run shift more of the exploratory (and other) R&D from Service management to direct OSD management under, say, ARPA. This might still further limit the roster of alternatives that receive serious attention, for it would probably increase the tendency to pick the approach judged to be "best" and to ignore other parallel approaches.

3. Force Structure

The fewer the alternatives that are explored in the R&D program, the more restricted will be the ultimate options with regard to the force structure. Whatever the range of options, however, centralization may through inadequate airing of divergent views and inadequate consideration of the alternatives lead to a less than optimal choice.

In considering force structure decisions, it is important to emphasize that centralized control regarding the over-all force

structure is desirable. To some extent it has always existed. Interdependencies among the programs of the separate Services are enormous, and these decisions need better coordination than loose bargaining among the Services can provide. By necessity the responsibility devolves upon the OSD. Yet, at the same time, if control becomes too tight, with the Services having a negligible impact on the final decisions, the latter may be far less than optimal. To be sure, a choice must be made: there can be only one force structure. Despite the preponderant role of the OSD in this choice, however, there should be a dialogue in which the voice of the Services makes the OSD alert to spillovers and other considerations it might overlook, though at the same time the Services should themselves try to recognize the interdependencies involved in the decisions that are made.

The need for centralized control regarding the over-all force structure is sometimes interpreted as justifying another type of centralized control for which the case is far weaker. Control over the over-all force structure should be distinguished from control over the choice of closely competing weapon systems, in which case the spillovers are much smaller at the margin, and therefore on which the voice of the individual Service can be proportionately stronger. OSD has tended in recent years to assert its primacy in the latter class of decisions. The most dramatic case has been that of the TFX. The evidence in that case provides no clear-cut demonstration of the superior insight of the OSD regarding specific weapon system choices -- and that in a period when OSD officials were recognized to be unusually intelligent, well-informed, and energetic.

Unfettered choice of weapon systems by the Services may have led in the past to a proliferation of such systems in the force structure. However, unified control may lead to too few, and this raises once again the vexing problem of uncertainties. To depend heavily on fewer systems implies a risk. It is impossible to indicate precisely what the optimal number of systems is. One cannot prove that whatever decision has been made is demonstrably wrong, but one can point to the imponderables. Diversity in weapon systems provides a hedge against

uncertainty. Lessened diversity implies certain costs that must be solemnly weighed against the gains. And, as has repeatedly been stressed, it is important to reckon with the full costs of our choices.

The inclination of the OSD has been to concentrate on a limited number of weapon systems, which are regarded as highly flexible in dealing with a range of foreseeable contingencies. Particular emphasis, for example, has been placed on Minuteman, in preference to heavier payload missiles, and on the TFX, which has been viewed as the appropriate instrument for an impressively large number of missions. This trend is sometimes referred to as "uni-weaponism" -- with the implication that it has gone too far. Is this a case of too many eggs getting placed in too few baskets? One cannot give a definitive answer, but it is a question which should continually be raised.

Thus, OSD control now encompasses (a) major force structure decisions where interdependencies exist in terms of effectiveness (where it is essential), (b) the decision to limit the number of weapon systems where interdependencies in terms of cost have been stressed in relation to hedging against uncertainty (where the exercise of control is open to debate), and (c) to choice between competing weapon systems (where the case is weakest). How will this power be exercised in the future? There are two points of concern of a general nature to which we will now draw attention, reserving to the next sub-section some specific mechanics of control which demand scrutiny.

First, there is the ever-present danger that the views of one group will prevail without adequate checks and balances. It should go without saying that even in force-structure choices, heroic judgments are required. Quantitative analyses can be tremendously helpful -- far more so than in R&D -- but any choice involves weighing some fearfully important non-quantifiable considerations. In addition to major differences regarding strategy, which must be explored if not reconciled, there are beliefs and intuitions regarding system effectiveness in combat, the likelihood of major limited wars and of escalation, and so forth. What one may want therefore is a mixture of views -- not merely heard but also represented by some real bargaining power.

One way of crystalizing the issue is to ask whether the dialogue between the OSD and the Services on these matters is in a healthy and flourishing state. It is a sobering question. There is evidence of a growing tendency to disregard Service viewpoints. For example, in preparing for the fiscal '66 budget, guidelines were sent to the Services with instructions to reclama only if new information had become available to them different from that on which the guidelines were drawn up. In the limited time period, this implied that reclamas were virtually excluded. But, more importantly, it may imply that in the future little attempt will be made to draw the Services into the forming of judgments on force structure -- rather it suggests that the Services will be limited to the function of providing information. If, as we have suggested, what we require is a rather delicate set of checks and balances -- neither too weak or too strong -- we may be drifting toward a set that is too weak.

Second, looking toward the future there is no guarantee that OSD personnel will avidly search for alternatives. So far the new OSD has been an enthusiastic vigorous group, and it may have done far more searching for alternatives than we can expect from OSD in the future. The pressures of routine work and a reduction in bargaining efforts by the Services may yield less emphasis on the examination of bothersome force-structure alternatives. Any agency is subject to developing stereotyped assumptions and models of the world which become unchallengable.

If tacit "agreements" to avoid rocking the boat ever emerge, obsolete functions can last on and on. While inter-Service rivalry and criticism provide no guarantee for the prompt elimination of obsolete missions, it does provice one mechanism for bringing such obsolescence -- as long as the Services are oriented toward the future and are provided with an incentive to criticize. Bureaucratic inflexibilities have apparently produced some curious choices in the Soviet Union. Some

major factors in producing these choices have been the privacy of communications and decision-making at the highest levels, the stilling of Service criticism and the encouragement of conformity, and a pattern of rewards and penalties which induced the Services to band together in covert resistance to pressures from above. A race with the Soviet Union in this respect is one we should seek to avoid.

4. Force Structure: The Blue Book and Reprogramming

Another source of concern regarding future receptivity and changing conditions to new ideas arises from an institutional device designed to bring order into defense planning, but which in itself will deserve careful scrutiny. Under the new system the approved financial plan for five years ahead and the approved force structure for eight years ahead are spelled out in the Blue Book. As a control device the latter may, however, discourage both flexibility and the search for new alternatives. If OSD is to exercise any kind of control, deviations from the program have to be difficult to effect and must be appraised by OSD. How does the system facilitate OSD appraisal and control? -- by reducing the number of alternatives that have to be considered. If each Service submitted an entirely new program and budget each year, it would be virtually impossible for a small staff to appraise and control it. OSD would then have to confine its attention to major decisions and to aggregative budgetary limitations. By confining the new proposals to formal PCP s -- that is, by reducing the number and complexity of the alternatives -- appraisal and control by top management becomes feasible.

This effect is so obvious that it has caused considerable concern. The OSD has recognized that dealing mainly with marginal changes under conditions of great uncertainty is a risky procedure, encouraging progressively less-than-optimal allocation. Therefore, despite its original inclinations, it is struggling against perhaps insuperable barriers to achieve program review rather than look only at the PCP's which the Services believe it is wise to submit or which OSD finds time to prepare. It may be, however, that to do this <u>effectively</u> requires,

at least in part, program reviews by the Services, and that this requires nurturing Service incentives to criticize the full programs.

How difficult is it to effect changes in the Blue Book? To achieve changes in the current year or in the fiscal year shown in the published budget, one must go through the reprogramming procedures. Congress must grant permission for certain changes and at least be notified about many others. These rules laid down by Congress are shredded out into more detailed rules by OSD and various echelons within the Services. To achieve significant changes in the "program years," i.e., the five years beyond the published budget, one must go through the PCP procedure.

The effect, as far as examining alternatives is concerned, is to rule out many substitution possibilities. The budget is divided into pots of money, and future programs into categories; and shifts of resources among these pots and categories are prohibited unless special permission is obtained. Sometimes (and this is nothing new) a laboratory has had plenty of funds to set up an experiment but has been unable to send anyone to observe it because the travel money had been exhausted. Sometimes there has been no telephone money even to inquire about the matter. Thus, to exercise centr[illegible] control, we preclude the consideration of numerous substitution possibilities -- that is, of numerous alternatives.

Now some control of this sort must exist. The real question is: how much of this inflexibility yields more gain than cost? The new system adds a new echelon (OSD) checking on reprogramming and change proposals, induces more monitoring of changes within the Services, creates more rules and thresholds governing substitutions, adds new categories among which resources cannot be transferred. In the long run this may significantly increase the cost of exploring alternatives, and thereby reduce the number of alternatives explored.

Moreover, there is likely to be a trend toward proliferation of program elements -- the compartments among which resource shifts are prohibited. When an OSD employee is asked to keep track of a set of

program elements, he is not likely to feel an urge to provide flexibility to the Services. He will want more "visibility" for him at the expense of flexibility for the Services. Thus there is danger in the long run that pressures will come from OSD for shredding out more and more program elements.

Moreover, in the long run, the Services may become reprogramming-shy and especially PCP-shy. If their proposals do not seem to have much influence, efforts to urge changes will appear to be relatively unrewarding. Or at least the Services may find efforts devoted to distant changes less rewarding than efforts devoted to urgent reprogramming requests for the coming fiscal year. In other words, if the Services have too little influence, one original aim of program budgeting -- getting the Services to look at the full costs of alternative choices -- may be frustrated. There is another reason that the Services may become PCP-shy. Where future programs exhaust the funds that can be expected, a plus-PCP can be approved only if something else gives. With each Command's expectations built up according to the Blue Book, preparing a PCP may entail a great deal of conflict and trouble. Either the Service must find a minus to accompany the plus proposal, or it must be prepared for OSD to cut something. One of these days it may seem easier not to rock the boat. Now this sort of hard choice is caused by life, not by the Blue Book. But gearing expectations to an official program for several years ahead may actually make it harder to face these hard choices.

There is a more fundamental problem than the creation of procedural barriers to allocation. What is the effect of long-range planning on the attitude toward flexibility? Without a Blue Book there is presumption that the future is flexible except where the need for commitment has been demonstrated. This presumption that nonplanning means flexibility is somewhat deceptive in that standards may be virtually nonexistent for judging when a "need" for commitment has been demonstrated. Below the highest policy levels many commitments may be accepted tacitly, but nonetheless tenaciously. Thus the development of a plan, if it is merely indicative and its tentative nature is understood by all

parties, may actually increase flexibility by making explicit (and vulnerable) commitments which otherwise would have remained hidden. On the other hand, a plan (especially if all the blanks are filled) can create the presumption that the future is fixed unless someone can demonstrate an urgent need for change. The burden of proof is placed on those recommending change. The costs of instituting change are greater than in the absence of a plan. But the real question is whether over-all resistance to change is greater than when lower-level units are free to make tacit commitments -- when framework planning does not exist.

Once again, this question is in the main one for the future. However, there are several factors in the environment surrounding decision-making that cause resistance to change. When anyone makes or even participates in a decision, he acquires an emotional commitment to it. It becomes much harder to change one's position once it is in print. If I am in charge, a change proposal that reverses my recorded decision has at least one if not two strikes against it. Apart from one's own emotional attachments, Congress and others look askance at vacillation and indecision. Frequent changes of mind make one look like either an oaf or a trouble maker. In Congressional hearings, legislators often say they are tired of all this reprogramming -- a perfectly natural attitude that is no doubt shared by various high-level officials.

No one can fail to admire Mr. McNamara's determination to bring about change when he felt it to be necessary; however, there is a question whether the costs paid to overcome resistance to change had to be paid in several instances (or whether Mr. McNamara's successors as Secretary of Defense would be willing to incur such costs). This reflects an institutional question whether the costs incurred in reversing semicommitments embodied in the Blue Book could not have been avoided. There is evidence that expectations are formed on the basis of the Blue Book -- expectations that need never have been formalized. In 1963 the OSD decided to reduce the 1969 programmed level for Minuteman below the level previously approved. Undoubtedly

major issues of this kind will arise again . The 1963 action touched off bitter (and time-consuming) controversy in the Pentagon, partly because the OSD reduction seemed to be taking away something that had been granted earlier. But why should such a controversy be permitted to develop in the first place. The 1969 force-level particularly for a specific weapon system should remain flexible not only in 1963, but in 1964 as well. Why should the DoD specify the force level for a particular strategic system so far in advance, when it may be altered not only by a major change in technology, but, more importantly, by unanticipated changes in the assessment of the Soviet posture. As subsequent events have amply demonstrated, the future posture of an opponent cannot be anticipated with any high level of confidence. A premature commitment provides little more than a source of nonproductive conflict and a decision which may have to be reversed but which may or may not be reversed . The purpose of such a commitment may be to provide a guideline, but the effect is to reduce flexibility. From their actions one may infer that both the OSD and the Services recognize that an entry in the Blue Book is indeed likely to reduce flexibility. For this reason we would like to stress our conviction that the main function of planning for the distant future should be to spell out the relevant information regarding future alternatives and that Blue Book commitments should be avoided until the appropriate decision point is reached.

A related mechanism for narrowing alternatives follows from the way decisions are reached, and to which the Blue Book lends some support. For the reasons described above, the Blue Book and centralization may convert what should be sequences of decisions into one-shot decisions. One reason is that a one-shot decision means that you make it, while a sequence of decisions means that someone else may make some of the choices. This makes it more vital than ever that the one-shot decision be right. As a consequence, one should feel the heightened urgency of taking interdependencies -- the relation between other choices and this one, the significance of tomorrow's events and budgets and decisions for today's choice -- into account.

Thus, alongside the tendency toward premature commitment regarding the long run, there are short-run pressures to delay decisions until there is high confidence it is the right one. The appropriate point for going ahead with some components in the decision complex may have come earlier, and if decisionmaking were done sequentially, those components of the total decision might have been decided on in a more timely manner and have produced valuable information. Thus the tendency to delay for the "big" decision reduces flexibility by eliminating the options that might have been produced by earlier decisions on sections of the major problem.* Pressures to delay always exist, both to take more interdependencies into account and for other, less fruitful reasons, but those pressures may be greater if the procedures adopted push us toward one-shot decisions.

5. Force Structure: The New 5th and 8th Program Years

Each year, as an old year expires, a new year is added at the end of the five-year financial plan and the eight-year force structure. How are these additional years planned, and in the process are numerous alternatives seriously considered? It seems doubtful that anyone ponders alternative programs very arduously. The Services produce objective-force documents, the JCS offers its suggestions, and OSD makes the final decisions. The eighth year is likely to be an extension of

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*Another way of putting this is to suggest that pressing for the "big" decision reintroduces some of the problems associated with concurrent planning. Both the Project Definition directive, and to a lesser extent the Blue Book, should force some care in using concurrent planning, by encouraging the resolution of major uncertainties prior to tooling up for production. But centralization may reintroduce some of the difficulties by causing dissenting judgments and therefore uncertainties to be overlooked. If you are led to believe there are no serious uncertainties, naturally you have a greater tendency to pick the best before you test or buy before you try.

No one can say how much concurrency is appropriate. It is clear, however, that either underestimating uncertainties or failing to investigate multiple and relatively cheap possibilities to resolve those uncertainties, represents an aspect of the concurrency approach that is counterproductive.

previously programmed trends, the fifth year a slightly modified version of the old sixth year with detailed cost estimates now added.

In this case the thing to be concerned about is not the relative lack of attention given to the new fifth and eighth years. It would probably be foolish to fret much about or make detailed comparisons of alternatives for those distant time periods. The thing to be concerned about is the advisability of committing ourselves to <u>any</u> program that far away. For entering these years in the Blue Book has more than token significance. From that time on, above-threshold changes must be made via PCP's, and, as noted above, some degree of inflexibility is generated. That is, entry in the Blue Book may make it more costly to examine alternatives.

Perhaps it should be re-emphasized at this point that we are pointing out only the possible costs of the OSD system, in this section the possible neglect of alternatives that may one day result. We are not calling attention to the gains provided by the OSD arrangements or attempting to weigh the costs against the gains. We do this because we think the costs may not have received enough attention and because we hope steps can be taken to reduce the costs without greatly reducing the gains that the OSD system aims to provide.

V. THE SERVICES' RESPONSE IN THE NEW ENVIRONMENT

In the preceding sections attention has been concentrated on those long-run costs that centralization under the new system may entail. Against these costs must be set those benefits, both short-run and long-run arising from better coordination of decisions and the introduction of techniques which may lead to better decisions in general. Such benefits, of course, reflect the objectives for which the system was established, briefly treated earlier. One may ask whether there are ways to avoid, reduce, or hedge against some of the costs of the system without seriously reducing the benefits obtained.

This section discusses some adjustments that the Services might make and others that they might urge upon OSD. Of the Service adjustments some are directed toward making for a more comfortable adaptation to an environment which has proved somewhat abrasive. Others are directed toward inducing OSD actions which will diminish centralization and its costs. This raises a fundamental point: the OSD attitude toward modification of the system will in large measure be shaped by the way the Services respond to it. The OSD (and the OSD alone) has the power to decentralize, just as it has the power to centralize. The Service response is all-important, for the OSD will surely not countenance decentralization until it is persuaded that the Services can be relied on not to utilize procedures which it regards as cumbersome, costly, option-suppressing, and leading to less-than-optimal decisions.

The adjustments suggested here would represent improvement in the judgment of a number of RAND staff members. We cannot, however, estimate the costs and gains of each change. Whether or not any such step would truly be an improvement has to be a matter of judgment. Choices among alternative organizational structures or budgetary procedures are examples of decisions that are wallowing in uncertainty -- and therefore decisions for which quantitative analysis can give pathetically little help.

A. SERVICE ADJUSTMENTS TO THE SYSTEM

1. The Attitude Toward Cost-Effectiveness Analysis

Previously the need for a continuing dialogue between the OSD and the Services was stressed -- particularly in regard to force structure decisions where, in the nature of things, there can be little decentralization. To conduct a dialogue there must be a common language. Cost-effectiveness analysis provides such a language -- one that is particularly illuminating in relation to output-oriented budgeting categories. For this reason we are disquieted by the lingering resentment in the Services directed toward both cost-effectiveness analyses and the new budgetary procedures. These institutional reforms accompanied a massive altering of power relationships in the DoD, but are not except in a fringe manner responsible for those alterations. The most controversial changes of recent years would have occurred in their absence. In the main both program budgeting and cost-effectiveness analysis should be viewed as technical and neutral instruments, and should not be blamed (or credited) either jointly or individually for other types of conflicts with which they happen to have been associated in time. These instruments should not be approached as the resented symbols of more fundamental conflicts, but rather as providing the appropriate means for communicating with OSD.

While we stress the appropriateness of cost-effectiveness analysis both as a tool in decision-making and as a vehicle for communication, there is need for a wider awareness in the Services of the ground rules of cost effectiveness analysis. Such an awareness would forestall unnoticed manipulation of the ground rules by OSD and permit a better defense of Service interests. In particular, we have in mind three specific issues on which officers should be forewarned. First, since the future is dominated by uncertainties and since both future strategic threats and opportunities can be discerned only in the grossest terms if at all, it is impossible to be even roughly accurate in indicating the nature of missions assigned to new weapon systems or in measuring their effectiveness. The Services should resist attempts by OSD to

obtain precise specification of the mission of systems right through the development cycle, pointing out that uncertainty regarding future strategic contexts precludes mission specification and that under the circumstances precise estimates of effectiveness are contrary to the ground rules of cost-effectiveness analysis. One may infer that the demand for precise mission specification at an early stage in the development cycle suggests an inclination to resist development under existing conditions.

Second, it should not be forgotten, particularly with respect to the pace of equipment replacement, that in strict logic cost-effectiveness analysis can never provide definitive answers until the over-all budget is determined -- even when cost and effectiveness parameters are known precisely. How much one wishes to invest in modest improvements in effectiveness depends upon the over-all availability of resources. Just as a citizen with substantial resources may decide that a Jaguar or Cadillac provides enough additional benefits to justify its purchase despite its higher cost relative to a Chevrolet, so in the public realm the relative availability of resources determines the extent to which the Services are permitted to purchase "superior goods" or "inferior goods"* in order to achieve optimal allocation of funds. This is an elementary principle of economic analysis. To the extent that the OSD treats cost-effectiveness analysis in isolation from over-all budgetary decisions, it is neglecting one of the ground rules of cost-effectiveness analysis.

Third, accuracy in cost estimation, while desirable in itself, is not so influential in the actual decision-making process as the governing image of cost-effectiveness analysis would suggest. While good ball-park estimates are useful inputs, only on rare occasions would errors of as much as 50 per cent affect the results regarding which systems to develop and procure. Consequently painstaking effort at refinement of cost data is likely to lead to diminishing returns. To be sure, either

*These terms are employed in their technical economic sense.

presumed errors in calculating costs or different estimates of the relationship of cost to benefit will normally be cited as justifying the rejection of a particular proposal. The OSD on occasion will use cost-effectiveness calculations more as an instrument of controversy than of analysis.* Decisions which have been made on other bases will be rationalized in terms of cost-effectiveness calculations. But this should not lead either participants or bystanders to exaggerate the role of precise cost calculations (or effectiveness calculations) in the process of reaching the decision

2. Improved Cost-Effectiveness Analysis for Communicating with OSD

Despite the need for alertness toward possible departures from the ground rules of cost-effectiveness analysis, there is no question that, in principle, more extensive use of sound cost-gain analyses is all to the good. Systematically examining all the gains and all the costs of alternative actions is the right way to look at problems of choice. It is important for the Services as well as OSD, i.e., for groups with different viewpoints, to make such analyses. This does not mean mechanical use of quantitative exhibits, of course, as there are many important nonquantifiable considerations and many difficulties in interpreting individual analyses. Needless to say, the desirability of this adjustment was apparent to the Services long ago, and they have been moving in this direction. We are merely re-emphasizing the advisability of employing careful cost-effectiveness studies in communicating with OSD.

Our suggestion is no more than exhortation, however, for we do not know how to insure that careful studies will be made, that they give due emphasis to incommensurables and uncertainties, or that they will influence OSD. As noted above, it is difficult to imagine a Service (or any agency with a position) producing and submitting objective comparisons of alternative systems. There is a very human tendency to turn

*In view of its adversary status, a certain amount of abuse by OSD of the tools it itself introduced is perhaps inevitable.

them into design studies pertaining to one system unless the comparison favors the Service position. Nevertheless, even studies that put a Service's best foot forward can provide valuable information. But incentives to make even these comparisons carefully will diminish if the role of the Services is weakened too much. Hence, while we exhort, we are not optimistic about the long-run prospects, if Service bargaining power continues to decline.

Along this same line, it seems to us that studies are the mode of communication to be emphasized. There may be little use in trying to refine PCP's. On important decisions, they have to be preceded by studies and informal communications, they cannot present complete analyses or review sensitivity tests and the arguments in full, and they are likely to become increasingly a device for keeping track of decisions and their cost implications.

3. Symmetry in Demands on OSD and the Services

Many questions may legitimately be raised regarding the structure and functioning of the new system. But reform must start from where we are, not from where we once were. Criticism must be constructive and it must be associated with an organizational structure and attitude within the Services which holds out promise that change will bring improvement. In particular, there is no point in criticizing habits of mind or tendencies in the OSD when the Services themselves exhibit those same tendencies. Let us bring out a number of illustrations. First, while a Service may legitimately express apprehensions regarding the consequences of centralization by the OSD, its criticism acquires logical force only if that Service itself is striving to avoid the pitfalls of centralization. If the penalties of centralization are to be incurred, it is not clear why this should occur at the Service level rather than the OSD level. Yet, Service procedures down to the present provide little assurance that the knowledge and the diversity existing at lower levels will be fully exploited.

Second, if concern is expressed regarding an OSD tendency to ignore the domination of the future by uncertainties and too early to narrow the range of future

capabilities and strategies, then the Services themselves must give due emphasis to uncertainties and not treat the future as preordained. For example, in light of the uncertainties the Services cannot insist that missions or effectiveness of new systems be forecast in advance and that they will not be altered by changing events, strategies, or technologies.

Third, the dominance of the future by uncertainties carries with it implications regarding the R&D program. What the Services should press for is a program designed to counter a variety of possible threats -- few of which may actually materialize. Given resource limitations, the United States cannot afford to deploy capabilities to counter all possible enemy threats. However, there should be in development projects designed to counter as many as possible of the discernible threats. This implies, however, that many completely successful developments will never be introduced into the force structure, because the particular threat it was designed to counter did not, in fact, materialize. Moreover, many developments will appear to be either unsuccessful or not worth additional outlays, and need to be cut off.

This places a considerable burden on the Services in managing their programs. Unless the Services can demonstrate a willingness to choose among existing programs and remorselessly prune out the least promising ones, they will [illegible] intervention from above. [illegible]y or another programs will be cut off. Moreover, the Services must accept the fact that successful development does not necessarily imply procurement. They may legitimately criticize the reluctance of the OSD to sanction the bending of metal in the development program, but if successful metal-bending is taken to imply procurement, then OSD's reluctance becomes understandable. Finally, the Services must strive to cut costs on individual development projects so that more projects can be carried on. Major benefits of decentralization can be extracted only if Service-designed projects are conducted as austerely as DDR&E-designed projects.

The process of adjustment for the Services will not be easy. Their attention has been oriented toward systems acquisition, and the pattern of R&D activities reflects that emphasis. Heavy

outlays, that could be avoided if development was not assumed necessarily to lead to procurement, were automatically included in the program. A few costly projects exhausted a substantial portion of the available funds, thereby narrowing the potential range of the R&D program.

If the Services are to re-acquire much freedom of action in managing the R&D program, they will have to alter their way of doing business. They will have to conduct developments austerely, cut unpromising developments off without prodding from above, and not press the OSD to procure simply because of successful development. But altering old ways of doing business is exceedingly hard. For instance, partly because of its obvious conflict with traditional ways of doing business, there has been much resistance to the Project Definition Phase. But Project Definition has a useful role to play in an R&D program which is primarily designed as hedging against a broad range of threats rather than as representing the first step in system acquisition. Project Definition should not be restricted simply because it cuts against traditional methods for acquiring systems.

4, Defending a Moderate Degree of Confusions in Pre-Systems R&D

Most of the adjustments required in R&D activities came out in dealing with symmetrical demands on OSD and the Services, and the need for alteration in the Services' way of doing business. One additional point needs to be made: when we talk of austere planning we do not mean to support the frequently heard demand for the elimination of "waste and duplication" in R&D. To the contrary, this notion is among the most powerful forces pushing us toward Cook's-tour planning of R&D. Ultimately, to avoid duplication and nonessential research, a high-level committee may insist that studies fit into exploratory development projects, which fit into advanced development, which fit into plans for systems development, which fit into presently recognized military missions. But planning to explore unknown territory should not be that neat. Things should not fit together well, there should be projects without a clear-cut objective, there should often be parallel approaches (i.e., partial

duplication, though two projects should never be literally 100 per cent duplicates).

Suggesting that the Services defend a moderate degree of confusion in exploratory and advanced development may appear to be superfluous and empty advice. However, we have the feeling that there is shame and defensiveness regarding any confusion or duplication in R&D. In such circumstances, pleading for a moderate shift in attitude may not be completely empty. Such a shift in belief is prerequisite to other steps. Moreover, the attitude being urged is a somewhat unnatural one. It goes against the grain to believe in the virtues of messiness, checks and balances, dissension, planning for work not to fit together, and so on. These things have little glamor -- and yet, in a world of uncertainty, they do have virtue (up to a point).

We have a little more in mind, however, than an oral defense of partial duplication in R&D. Decentralization is the surest way to avoid too much "dovetailing" and too little dissent in planning R&D projects. In connection with any defense of partial duplication, it would be appropriate for the Services to decentralize their own planning of studies, exploratory R&D, and advanced developments. (One might call this a "25-year plan" instead of a 5-year plan, because it is planning for uncertainty and the long-run). One possible offer would be to give AFSC and its divisions more security, eliminating at least some of the constraints and reviews that are now imposed. This would reduce the extent to which exploratory ideas are reviewed and reviewed until they fit an Air Force position. (As has been suggested, OSD might then be willing to diminish its efforts to review R&D programs until they fit an OSD position.) Dispersing authority a bit could encourage a wide-ranging exploration of ideas, which currently may be rejected if they appear to impair the chances of getting a particular system approved. The value of wide-ranging explorations -- not tied to any military requirement (unless it is the "requirement" for information and flexibility) -- is likely to go up if (1) systems development becomes more expensive, (2) operational systems become more specialized

(i.e., less flexible), and (3) weapons control agreements ban various other activities. Under such circumstances, the value to the nation of some decentralization of R&D activities is likely to increase.*

B. OSD CHANGES THAT THE SERVICES MIGHT URGE

We now turn to consideration of those changes that the Services might urge upon the OSD. However, it is appropriate to reiterate at this point that the power to decentralize authority rests solely with the OSD. Barring a reversal of attitude in OSD, a fundamental change on the issue of centralization vs. decentralization will come about only if the OSD is convinced that past deficiencies in the way the Services conducted business have been eliminated. The kinds of adjustments previously discussed are, we believe, a necessary though not a sufficient condition for decentralization. The Services will have to demonstrate the ability for conducting their affairs at least roughly in the manner that the OSD regards as desirable. Viewed from the standpoint of OSD, the Services must earn the right to increased responsibility.

This implies that pressure for quick change will be fruitless and that change will come only gradually as the Services demonstrate to the satisfaction of OSD their ability to make adjustments. Keeping in mind the mechanics of the new system, there are several important routes to change within the system that the Services should have in mind as it seeks to lessen the costs of centralization and premature commitment.

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*Perhaps it should be reiterated that we are not advocating the elimination of planning or control, or that scientists and firms be financed to do whatever they wish, happily unaware of military problems. We are suggesting the planning of such programs by a diversity of groups so the work will not be tied to one view of the future.

1. Higher thresholds for Changes Affecting the Program Years

One change that would give the Services greater authority without really impairing OSD's ability to coordinate important choices would be to raise the thresholds, say to $100,000,000 (impact on total costs). Higher thresholds have been urged by the Services, and some of the thresholds were raised slightly in 1964. In our view, they should be raised quite a bit more. The aim would be partly to reduce the number of relatively small decisions that at present burden OSD and the Secretary of Defense, partly to make possible quicker and easier shifts of resources. But the aim would be principally to provide the Services with greater responsibility and authority and thus to keep the Services conducting their affairs in an aggressive manner.

A threshold of $100,000,000 would not bestow much bargaining power on the Services. They could make substitutions from one program element to another, and in that way take the initiative occasionally, but they could not exceed the limit placed on total obligational authority. Actually it is doubtful, in present circumstances, that they would bother much with the program years other than the one immediately ahead -- the year that was at that time being converted into the next published budget. Even this much authority, however, would maintain greater incentive to criticize, to examine alternatives actively instead of becoming too passive, to review programs as well as submit judicious POP's, to be concerned about long-range planning rather than short-run housekeeping.

To be sure, it might be less clean and neat, for it would result in some abuse and some mistakes. If you give anyone additional initiative, there will be a few blunders, a few transgressions. OSD could have an after-the-fact review of below-threshold decisions, perhaps on a sample basis. Flagrant abuse could be punished, either by withdrawing the powers in question, or refusing to move further with decentralization. It is likely that no greater deterrent would be necessary. OSD would need no new powers; the unstated threats would deter most of the obvious abuses. Our belief is that the gain would outweigh the cost --

this little increase in bargaining power would help harness the self-interest of the Services to achieve the broader interests of the nation.

2. Higher Thresholds for Reprogramming

If Congress as well as OSD could be persuaded, the "thresholds" for reprogramming (i.e., changing the programs already enacted or about to be considered by Congress) should be raised also. With inflation and the present size of the Defense Department, they are a little out-of-date, and they too keep the Services from considering substitution possibilities and "looking for business" as much as they otherwise would. These thresholds help keep a Service from getting a foot in a door, and often, to be sure, the door is one that it would be inefficient to enter. It is our contention, however, that we should encourage the Services to keep opening doors and peering through them. Doing this is worth a few wasted trips up the stoop.

As before, after-the-fact reviews would be possible, and Congress has ample punitive powers, which should deter flagrant abuse.

3. Keep Blue Book as Incomplete "as Possible"

Having a five-year plan yet deliberately keeping it incomplete may sound like an [illegible], but in many instances the best plan is a blank plan. When there is great uncertainty about the program, the most accurate television guide does not say "Perry Mason," it says "To be scheduled." Or consider Lewis and Clark again. It would not be a good plan if they had said, "We don't know what town we're going to hit that day, but we've got to fill these blanks -- let's put down Sheboygan." But put frivolous illustrations aside. In the Blue Book, we should have five-year costs spelled out only for program elements where relatively firm decisions really need to be made. Why should other parts be filled in? To be sure, it is helpful for high-level officials and others to write down and consider highly tentative

decisions or "guesses." But this should surely take the form of alternative programs "to think by" -- not a single officially approved program.* Another reason for filling in the blanks might be for the sake of neatness, but we hope such considerations are too trivial to consider. Perhaps another reason is in order to dispose of squabbles and reduce the number of issues requiring settlement or to make commitments now lest the decisions be made differently by someone else later on. This boils down to foreclosing alternatives, however -- something that usually should be avoided.

There is no inherent necessity of treating all program elements alike in this respect. Some program elements are partially unfunded now (we point this out as a virtue, not a defect), and this could occur more rather than less often. The five-year program could concentrate on those items with long leadtimes or with long-range costs disproportionate to present costs. It could avoid specific plans (i.e., commitments, even if tentative ones) for those items that can be handled more flexibly, either due to short leadtimes or different cost patterns. It is true that a one-year time horizon is inadequate for many decisions, but a five-year time horizon may -- in view of the uncertainties -- be excessive for other decisions. What we should strive for is less rigidity and avoidance of premature commitments. To keep the Blue Book a little less complete might make it a more meaningful exhibit and a more useful base-line -- and prevent attention from being shifted more and more to the preparation of the President's Budget.

More radical measures might be worth considering, though we are not advocating them. There is nothing sacred, of course, about a five-year period. Maybe a four-year plan is all we should have <u>as an approved program</u>, with other tentative projections being merely "programs to think by." Or possibly that is what the whole Blue Book

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*Several members of the RAND Cost Analysis Department have suggested that various colors be used to distinguish between firm commitments and those that are merely tentative.

should be -- merely an information system to assist OSD in reaching major force-structure choices. It seems likely, however, that the Blue book (or its equivalent) has to be used as a control device to ensure coordination of certain decisions that do indeed need coordination.

Given the present degree of centralization, the Services themselves are likely to want the Blue Book filled up. That is, it may appear to be the best tactic to keep their budgets from being eroded. If they acquire additional bargaining power, however, they might be willing to have the Blue Book incomplete and to urge OSD to move in that direction.

A corollary of this suggestion is "keep the Blue Book as imprecise as good cost estimation requires." With regard to the distant years, good estimation leads to imprecise cost estimates, because good estimation seeks to measure what really exists, and uncertainty is what really exists. Highly sophisticated, time-consuming estimates of costs five years hence have a spurious precision, not a real precision. An installation planned for the end of the coming five-year period, for example, can be "costed" right down to the last nail, but if things are managed properly, many features of that construction proposal are going to change. Refining such entries in the Blue Book is not worth a great deal of effort.

4. Decentralizing Authority Over Studies, Exploratory Development and Advanced Development

As noted before, we believe there should be some degree of decentralization in the approval of studies, exploratory development, and even advanced development. If there were fewer reviews within the Services so that the program would have less conformity to Service positions, the OSD itself might come to exercise less control over these choices. As emphasized earlier, it would be worth some "duplication" and inefficiency in the small to keep lower levels thinking about contingencies and probing for alternatives.

5. Screen Proposals for Engineering and Systems Development as Development Proposals, Not as Procurement Proposals

Although proposals for engineering and systems development should be screened carefully, we should not behave as though deciding to procure and operate when deciding that a system should go into Program Definition. If future OSD personnel, Congress, or the public begin to regard this decision as a procurement decision, there is danger that they will want the options screened too carefully and that they will give too much emphasis to quantitative analysis. Even systems development decisions involve great uncertainties, and with a high degree of centralization there will develop pressures to simplify decision-making, to apply the same procedures to large categories of decisions, and to neglect uncertainties.

In our view it would be healthy insurance against this to keep systems and operational developments in Program VI (R&D) and to confine the programmed costs to development costs. To estimate potential payoffs one has to look at future procurement and operating costs (and this should be done), but there is no need to put these costs prematurely in the Blue Book or to make premature commitments.

6. Tie Program Decisions More Closely to the Annual Cycle

To give better guidance to lower levels and harness their self-interest more effectively, OSD ought to link the new system more closely with the annual budget cycle. This would call especially for reviewing programs and all proposed changes -- in effect, considering alternative budgets -- in time to pare them down to the ceilings desired by the Secretary of Defense. Although firm cut-off dates are not ideal, they seem to be needed. If batches of PCP's are reviewed intermittently, the full impact on the budget cannot be anticipated, and, toward the end of the cycle, deep subject-issue cuts have to be made, cutting across and disrupting many program elements (and sometimes conflicting with simultaneous PCP-decisions). In the end this may work to confuse lower levels, impair incentives, and make more

centralization appear to be necessary. If PCP-review were more closely linked with the budget cycle, the Secretary of Defense could give ball-park ceilings to his program offices, these ceilings could then be taken into account more effectively in reaching program decisions, subject-issue cuts could be modest in size, and these cuts could come after, not along with, PCP decisions. Also, if some degree of decentralization is desired (and we have argued that it should be), this kind of procedure and guidance would facilitate giving some additional authority to lower levels.

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Within the existing framework of OSD, these are a few steps that might be taken. We hope that other modifications will be suggested. The issues here raised regarding detailed OSD control and review are serious ones. These and other changes should be given careful consideration as the new system continues to evolve.